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FramWat Final Conference; 9 June

Steps toward application of N(S)WRM in the river basins



Guidelines to improve water balance and nutrient mitigation by applying system of N(S)WRMs



Sabina Bokal, Global Water Partnership Central and Eastern Europe
Monika Supekova, Slovak Water Management Enterprise
Anja Potokar, Limnos

GUIDELINES TO IMPROVE WATER BALANCE AND NUTRITION MITIGATION BY APPLYING SYSTEM OF N(S)WRM



VISION & OBJECTIVES & USERS



BACKGROUND



STEPS

Stakeholders

Manual on effectiveness

Cost analysis





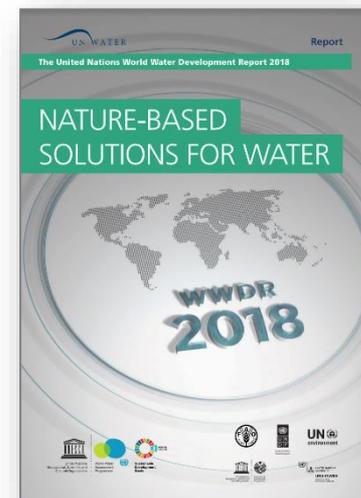
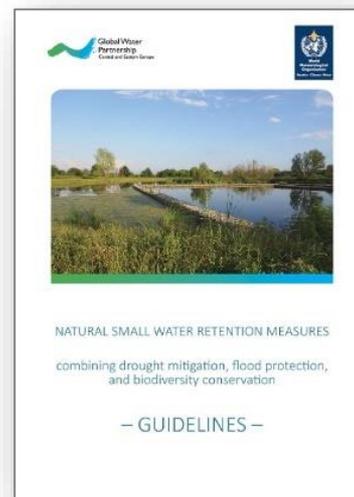
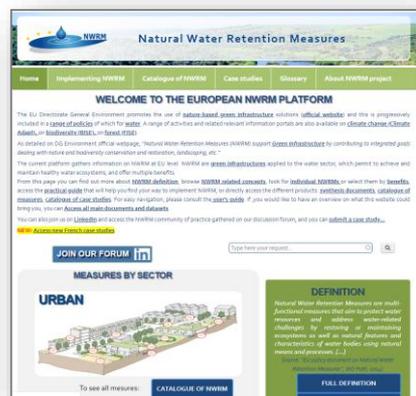
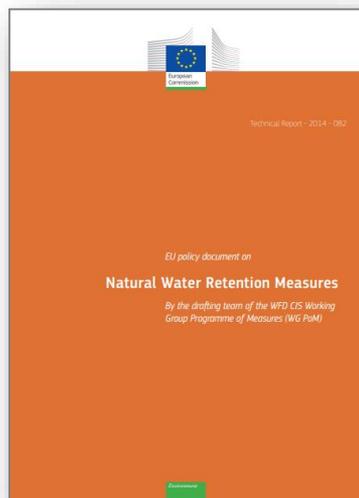
Contribute to the improved
Integrated Water Resource Management capacities
for development of the
Natural (Small) Water Retention Measures
as part of water management planning process.

- **STRENGTHEN** the N(S)WRM planning process and support implementation of Water Framework Directive (WFD)
- **SUPPORT** development of systematic approach through bottom-up dialogue
- **CONNECT** all the FramWat tools and support their sustainable use



Credit: GWP CEE

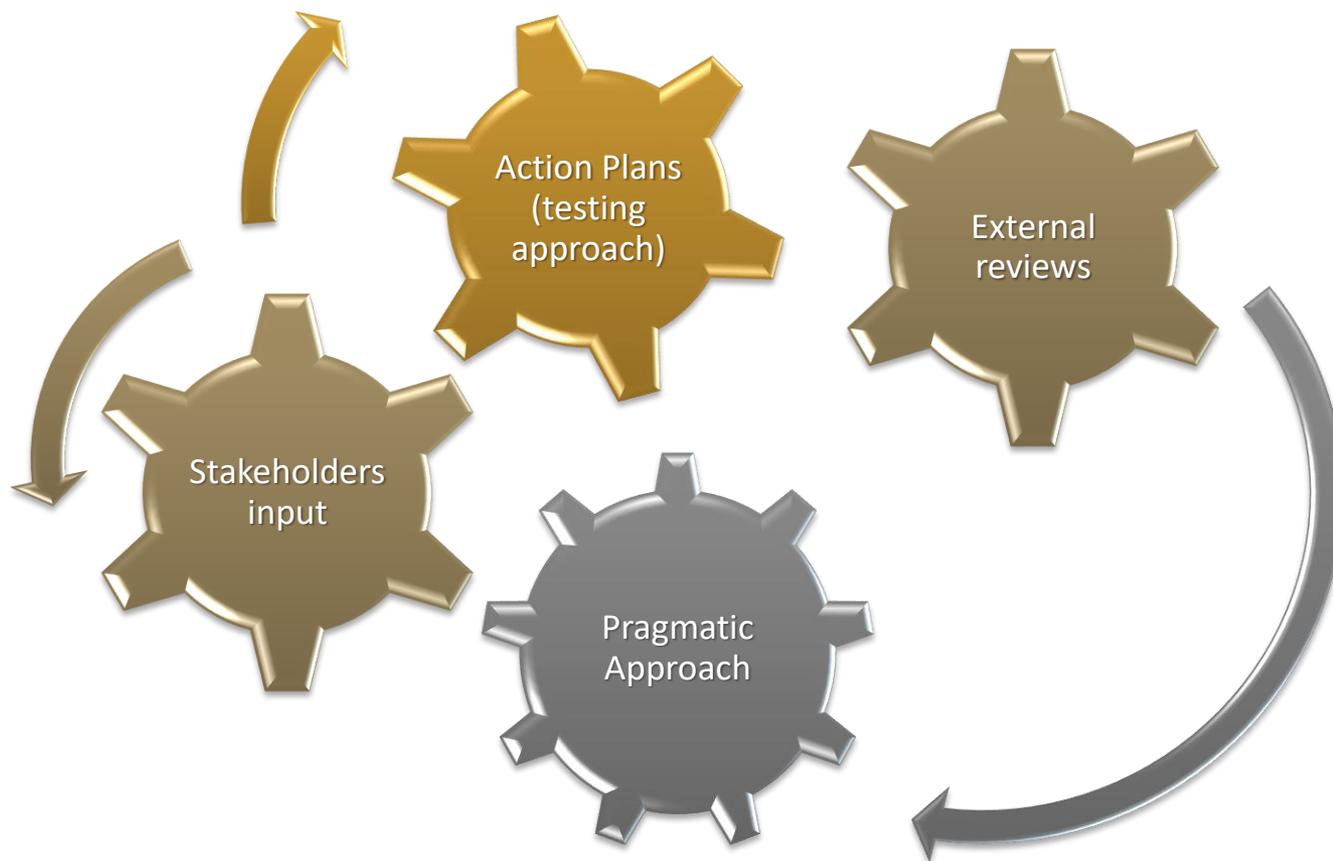




Water Framework Directive (WFD) obligations
(preparation of third River Basin Management Plans)
and
building on already existing knowledge, sources, data



PROCESS OF PREPARATION





Water management (river basin organizations, water authorities)



Nature conservation



Agriculture, forestry and fisheries



Recreation and Tourism



Spatial planning



Policy makers

Decision makers, experts and stakeholders involved in the selection, design and implementation of NWRM as part of plans and programmes addressing water, floods, droughts biodiversity, climate change adaptation, agriculture, etc.



STEPS FOR APPLICATION OF N(S)WRM IN THE RIVER BASINS

STEP 1: Preparation Phase

STEP 2: Valorisation of the catchment

STEP 3: Potential measures and scenarios for
situation improvement

STEP 4: Developing the Concept Plan

STEP 5: Concept plan into Action Plan

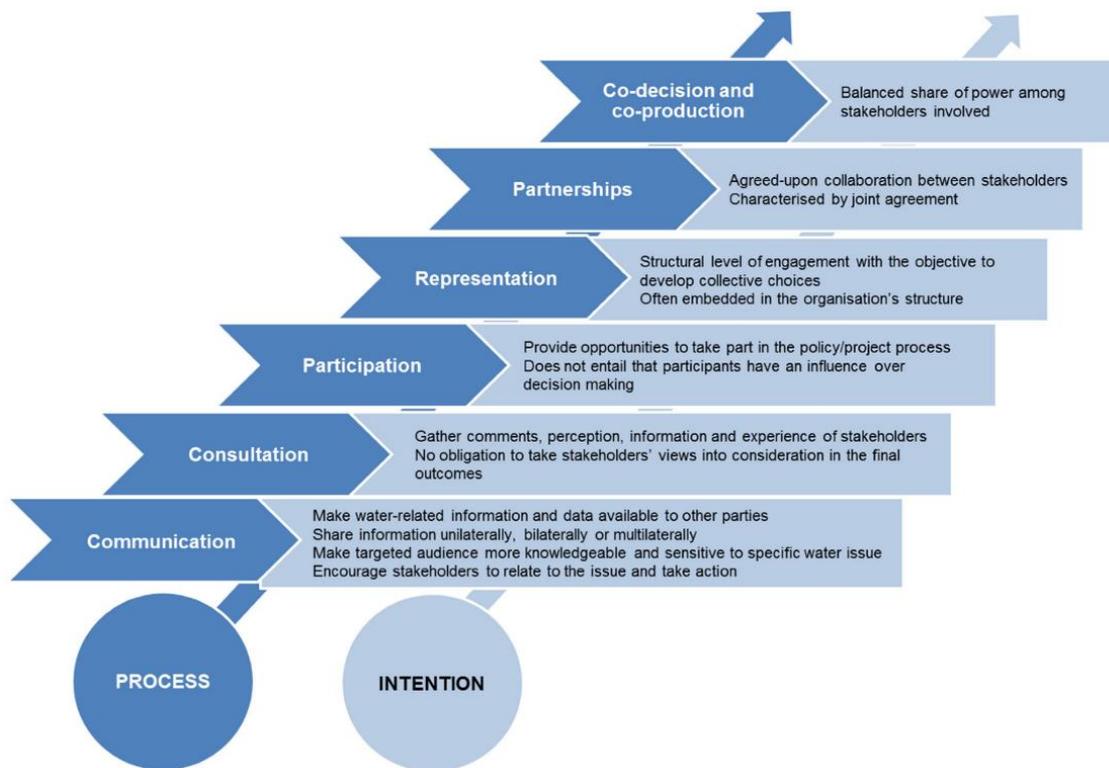
contributing to
awareness-raising
and ensuring ownership



increases the likelihood of
success and effectiveness

Water Framework Directive	<i>Article 14: „Member States shall encourage the active involvement of all interested parties in the implementation of this Directive.... in the production, review and updating of the river basin management plans....“</i>
Floods Directive	<i>Article 10: „Member States shall encourage active involvement of interested parties in the production, review and updating of the flood risk management plans.“</i>
Biodiversity Strategy	<i>Section 4.1: ...“active involvement of civil society will be encouraged at all levels of implementation.“</i>
Common Agriculture Policy	<i>It can play a very important role in improving the quality of rural development programmes by increasing the involvement of stakeholders in the governance of rural development as well as in informing the broader public of its benefits.</i>

TAKING COOPERATION FORWARD



OECD Typology of level of stakeholder engagement

Local impacts of NWRM



Emphasis on the bottom-up approach

Multi-benefits of NWRM



Different stakeholders engaged



Catchment identification

- Characteristic of the catchment
- Problem identification
- Catchment data

Defining the catchment, collecting input data and starting the process.

Planning stakeholder involvement

- Preparation of a Stakeholder Plan
- Set objectives for engagement
- Design the process

Planning Stakeholder engagement:

- 1) **Why** to engage?
- 2) **Who** to engage with?
- 3) **What** to engage about?
- 4) **How** to engage?



STEP 2: VALORISATION OF THE CATCHMENT

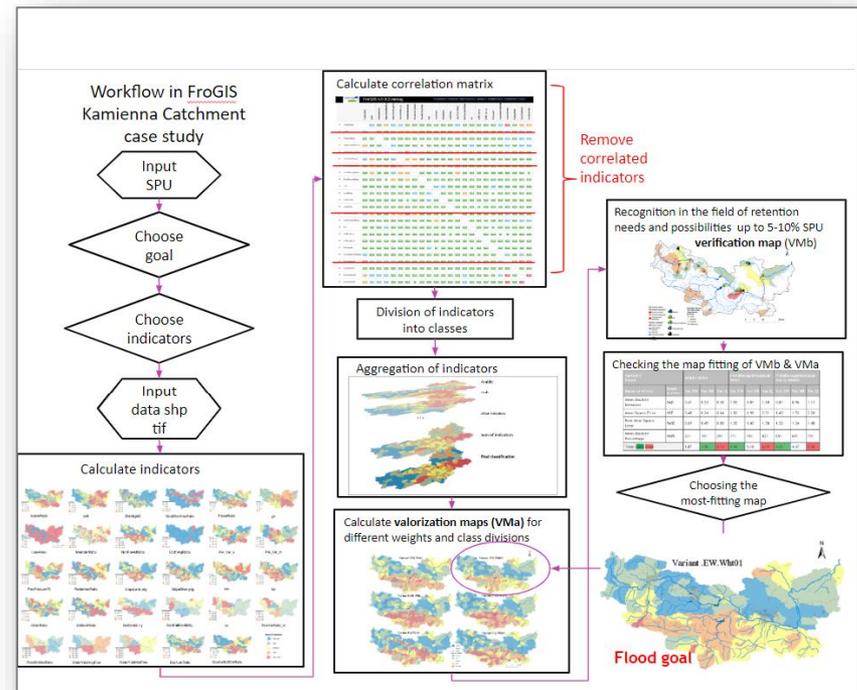
FroGIS tool

- to assess where measures are possible and needed in the catchment
- to identify the most crucial/appropriate location for NSWRM
- ... together with Stakeholders

Prioritization of the areas and building scenarios for carrying out NWRM



<http://WaterRetention.sggw.pl>



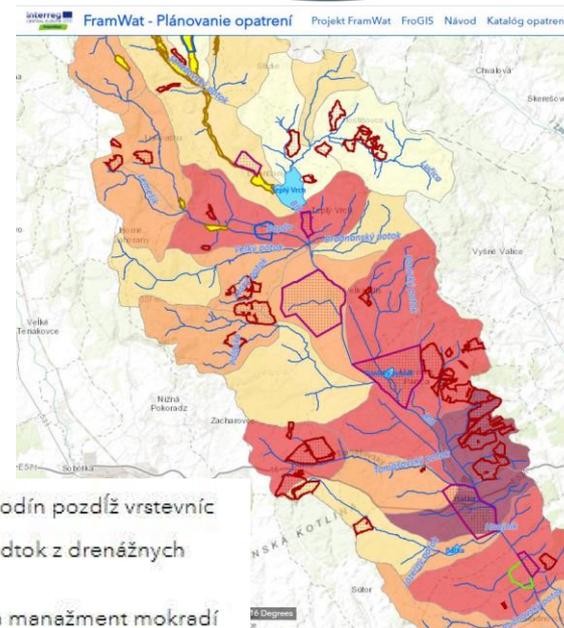
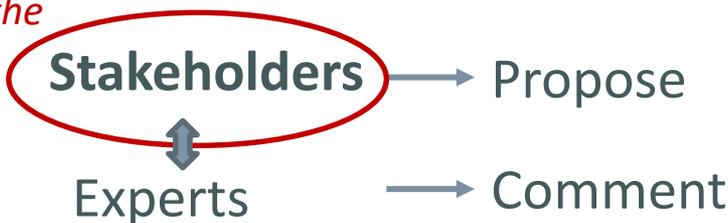
STEP 3: POTENTIAL MEASURES AND SCENARIOS FOR SITUATION IMPROVEMENT

How to prepare a scenarios?

- Results from FroGIS
- Expert analysis of possible measures for the location
- Interaction with stakeholders

Preparing a possible set of measures (scenarios) to improve water retention in the catchment

Initiators of the process



- A04 - Vysádzanie plodín pozdĺž vrstevnic
- D01 - Regulovaný odtok z drenážnych systémov
- N02 - Revitalizácia a manažment mokraďí
- N03 - Revitalizácia záplavových oblastí a ich manažment
- T1 - Poldre, suché protipovodňové nádrže, priehrady na zachytávanie sedimentov



Comparison of the scenarios → efficiency and combination of NWRMs:

- **Static Tool**
- **Dynamic Models**
- **Manual on cumulative effectiveness of the system of NWRMs**

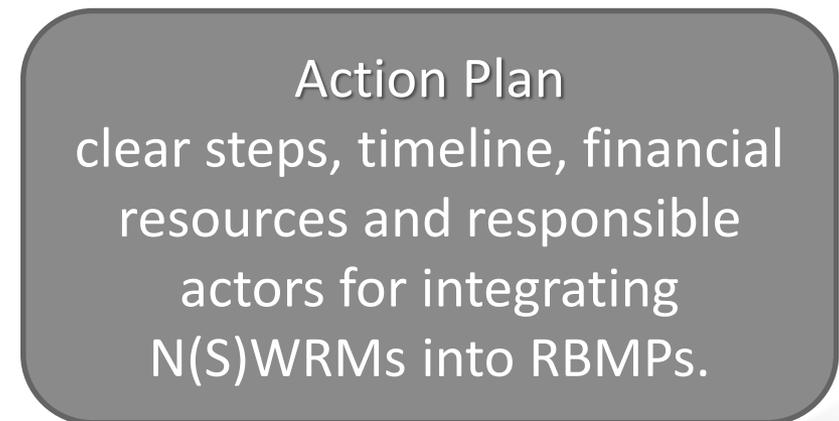
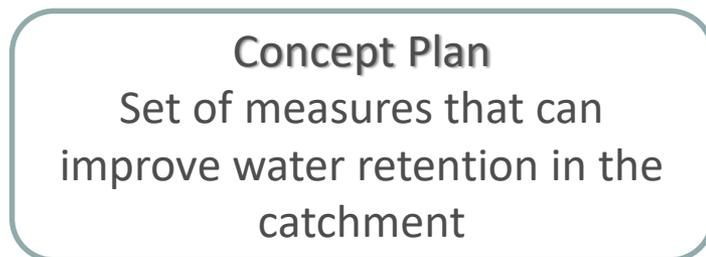
Choosing the best scenario for improvement of water retention in the catchment

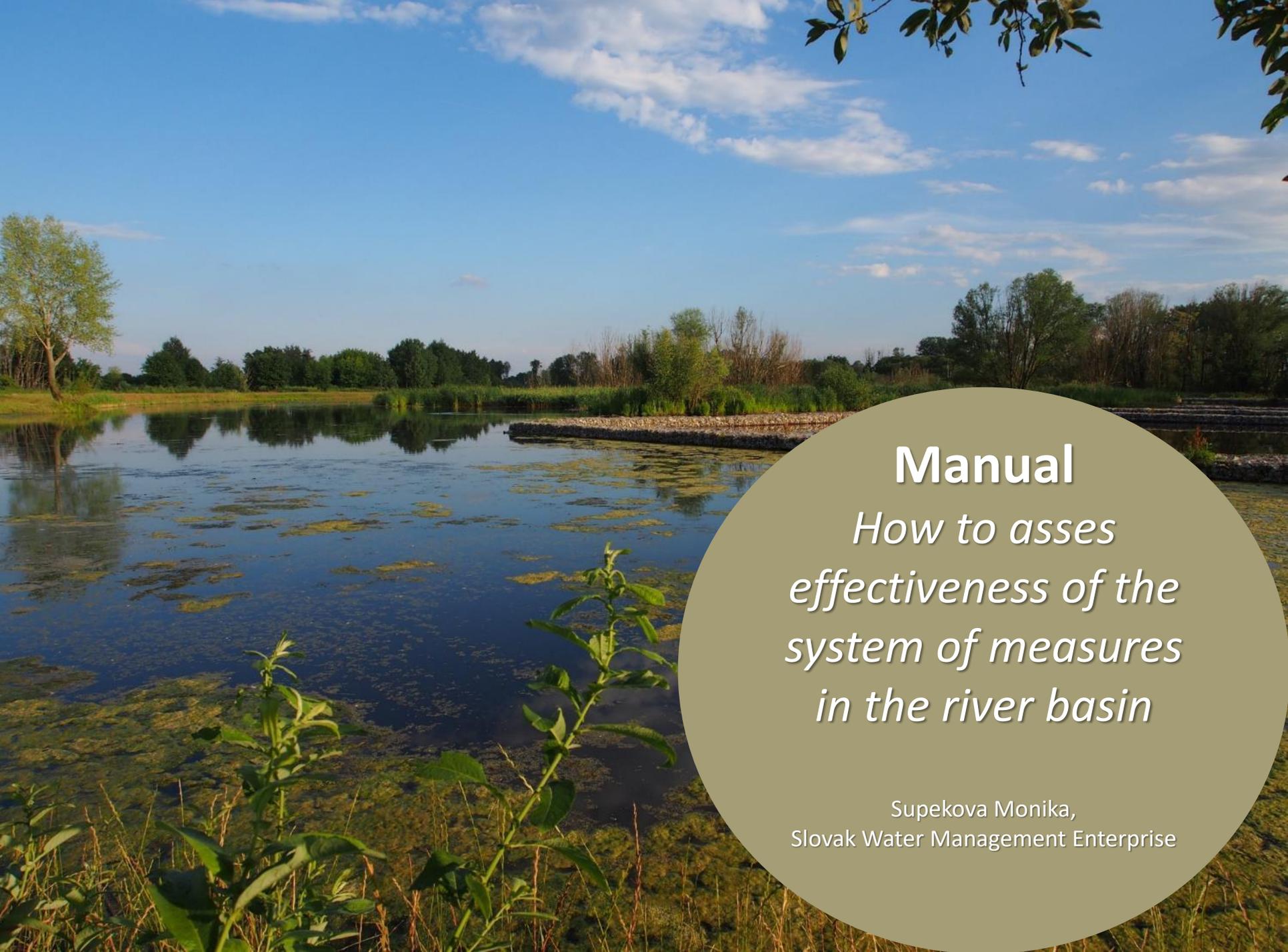
Concept plan
information on type of measures, best locations and cumulative effectiveness of NWRMs in the selected river basin



Upgraded Concept Plan:

- Legislation analysis
- Multicriteria analysis
- Cost analysis





Manual

*How to assess
effectiveness of the
system of measures
in the river basin*

Supekova Monika,
Slovak Water Management Enterprise

To support selection of most effective NSWORMs to:

- help regional and national decision makers and authorities to prepare RBMPs, FRMPs, compile APs for the next planning cycles
- and facilitate consultation processes between different sectors in countries (agriculture, forestry, municipal authorities, etc.)
- choose best scenario/variant

Manual:

- is applicable tool providing set of procedures for evaluation of direct or cumulative effects of combination of NSWORMs
- using outputs from other WPs tested in pilot catchments



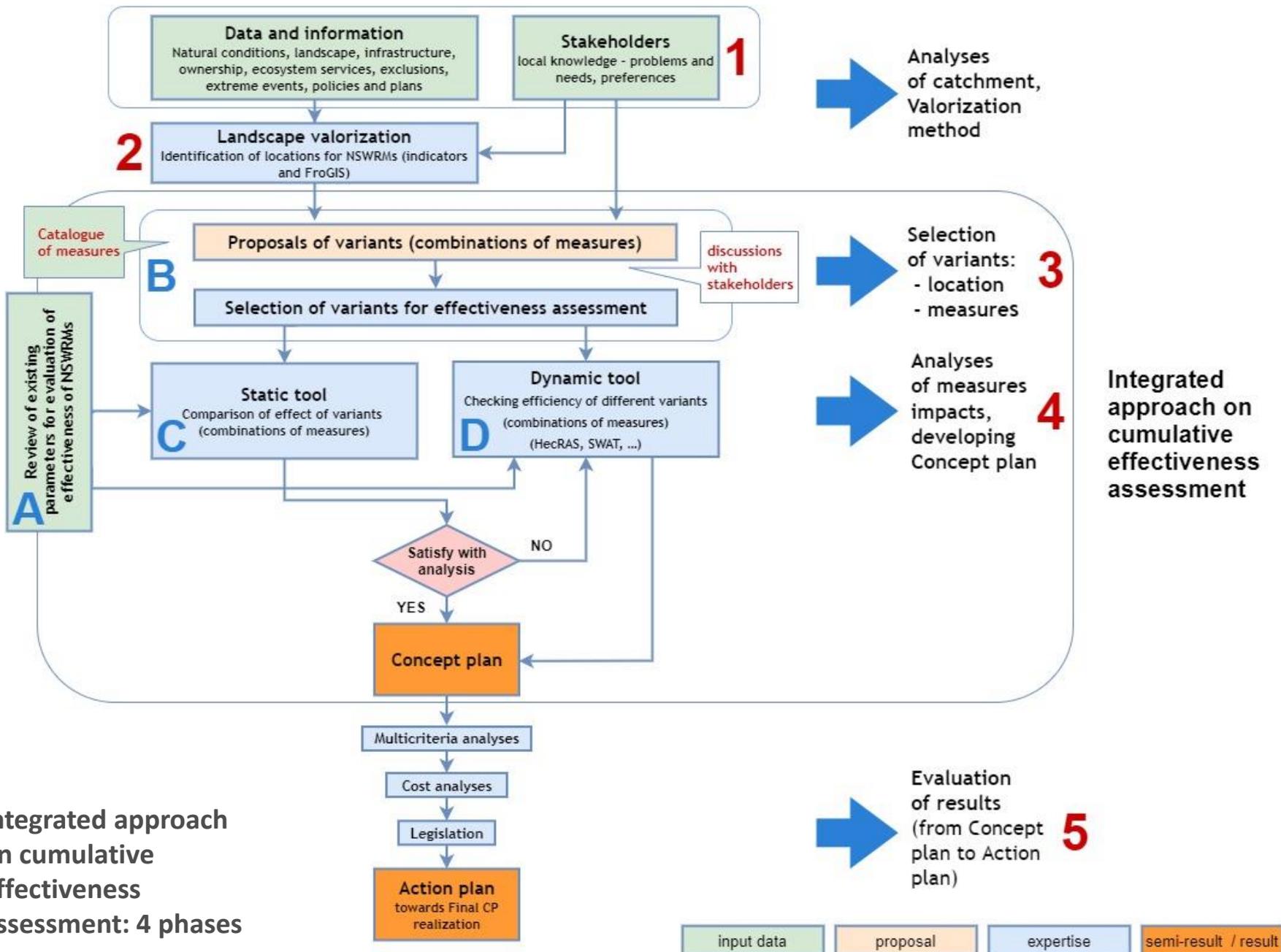
Manual – phases:

- Proposal of variants/scenarios of combination of NSWORMs in river basin based on NSWORMs collected in Catalogue of measures (or own measures)
- Application of:
 - GIS based method to assess cumulative effect of NSWORMs at river basin scale (Static tool)
 - dynamic water quantity and/or water quality models (hydrological and/or hydraulic models)

Static tool: to compare efficiency of variants/scenarios of combination of NSWORMs

Dynamic models: to check efficiency of variants/scenarios of combination of NSWORMs and to tune variants (if needed)





Integrated approach on cumulative effectiveness assessment: 4 phases

Concept plan = set of NSWORMs (recommended for MCA, CA, legislation application)

For each phase defined:

- Input requirements
- Technological requirements
- Users skills and knowledge
- Time investment
- Amount of work

User should be clear with:

- whether he will use pre-defined values or own values
- scale of decision makers planning level (national/regional/local)
- available input data and their level of detail
- available experts to cooperate





Cost analysis

Anja Potokar, Limnos

COST ANALYSIS (CA)

OBJECTIVES:

- Development of the approach on how to calculate and analyse N(S)WRM costs **on river basin scale (not CBA)**
- Provides an **important basis for decisions** on N(S)WRM investments

PILOT TESTING: WULS, CW, MTDWD

PROCESS:

Grouping
measures

Data collection
for CE Region

Pricing basis



STRUCTURAL (engineered) NSWRM

Cost method	Advantage	Disadvantage	Applicability
Simplified approach - cost by comparison	No cost assessment needed.	Can lead to major mistakes and poor judgement.	Not recommended.
Simplified approach - cost by typical group of works	Only a rough estimation.	Needs basic design. Common use in feasibility studies. Possible mistakes.	Applicable for experts for screening or deciding which among several measure to proceed with.
Detail approach	Most accurate method.	Needs detail design and time consuming.	Applicable for experts.

WHAT KIND OF DATA DO WE NEED FOR COST ANALYSIS (EXPERT INPUT)?

- Elaboration of basic design;
- Assessment of typical group of works;
- Assessment of difficulty factor;
- Assessment of preparatory and finishing works.



SOIL CONVERSION COSTS:

- derived from changes in agricultural practices
- Cost of farming:
 - fixed costs (building cost, infrastructure and machinery) and
 - variable cost (material, labour, energy, machinery).

TREE PLANTING COSTS:

- derived from planting
- Cost of planting:
 - site preparation,
 - the plants and
 - planting.

OVERVIEW OF NON-STRUCTURAL MEASURES

WHAT KIND OF DATA DO WE NEED FOR COST ANALYSIS (EXPERT INPUT)?

location;
number of hectares cultivated;
fertilizer usage;
herbicide usage;
seed amounts;
labor (no. of working hours);
fuel for farm machinery;
machinery (rental cost);

location;
number of hectares planted;
plant density (number of plants per hectare or kg of seeds per hectare);
plant size (depends on the age of tree);
types of plants (species);
way of planting (hand-planting or machine-planting);
plant protection (fence).

CONCLUSIONS

- **Level of detail** of cost assessment remains a live issue across the approach and pilot action confirmed this. A degree of pragmatism is required.
- **Expert judgment:** Approach requires collaboration of various experts (agriculture, forestry, hydro engineeres, economics).
- The results are not based on detailed design - only indicative values for planning purposes are considered, not for project development;
- Pilot action encourages debate on how to secure political commitment and financial resources for NWRM implementation.
- Approach can be used and implemented in CE Region by policy officers, planners, water managers, etc.



STEP 1: Preparation Phase

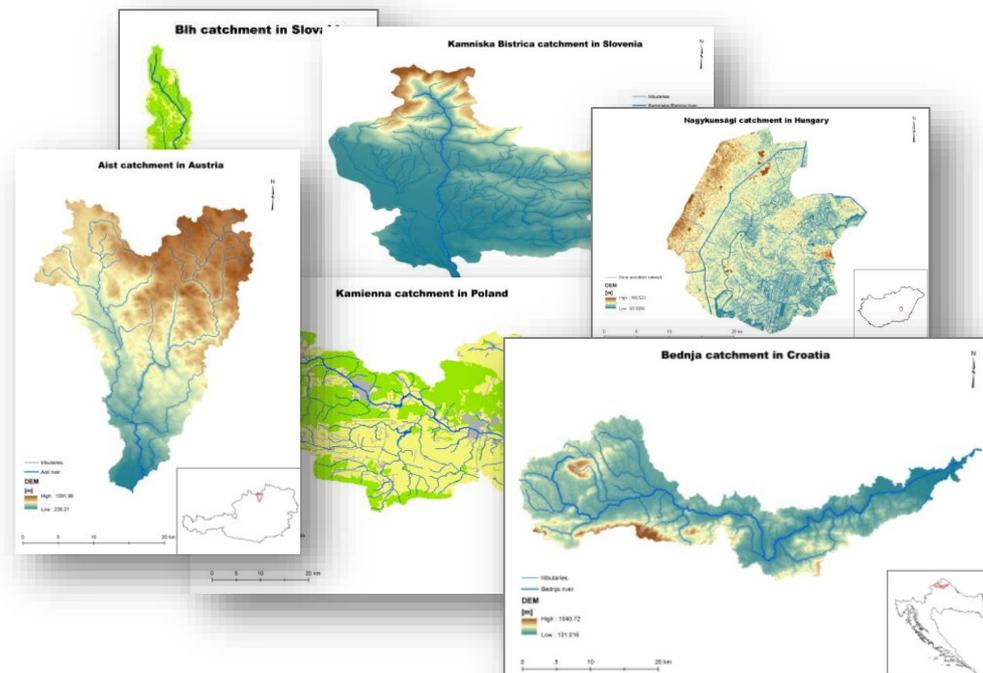
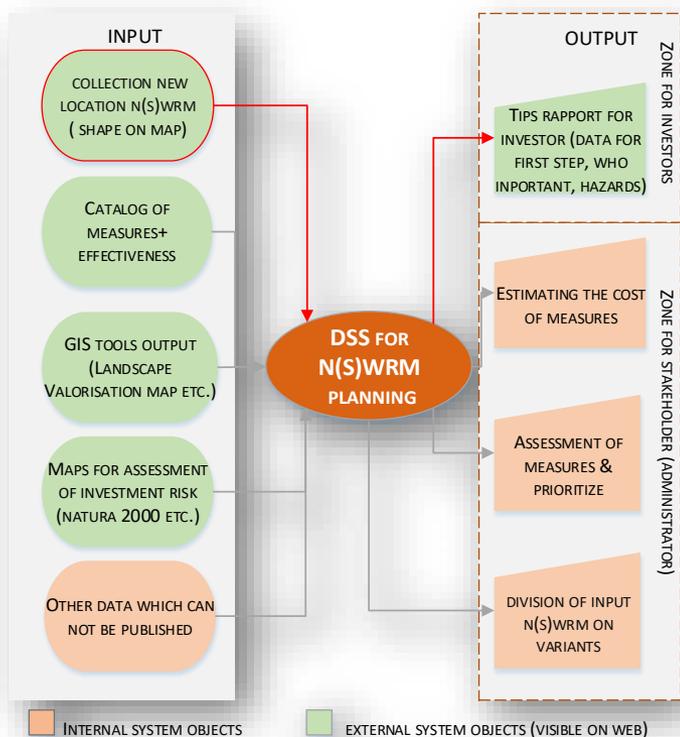
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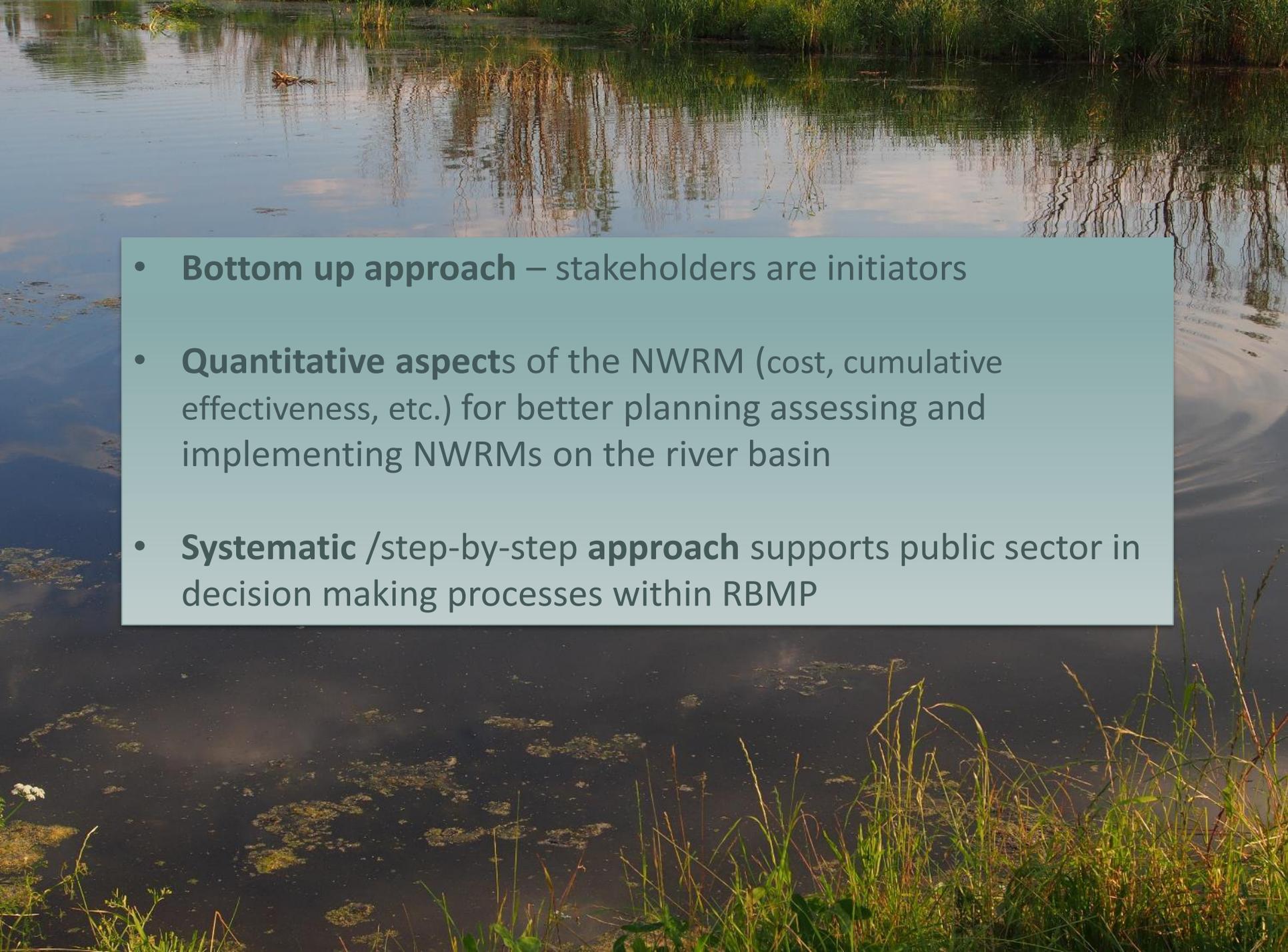
STEP 5: Concept plan into Action Plan

Decision-Support System



FramWat Pilot areas examples
recommendations on implementing each
step / using specific method



- 
- **Bottom up approach** – stakeholders are initiators
 - **Quantitative aspects** of the NWRM (cost, cumulative effectiveness, etc.) for better planning assessing and implementing NWRMs on the river basin
 - **Systematic /step-by-step approach** supports public sector in decision making processes within RBMP

SMALL RETENTION – BIG DEAL!



Thank you!

sabina.bokal@gwpcee.org

monika.supekova@svp.sk

anja@limnos.si

